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NHTSA 99-6550-13

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February 22, 2000

Mr. Stephen R. Kratzke
Associate Administrator for
Safety Performance Standards
National Highway Traffic Safety Administration
400 Seventh Street, SW
Washington, DC 20590

Dear Mr. Kratzke:

REFERENCE: Federal Motor Vehicle Safety Standards: Heavy Vehicle Antilock Brake System (ABS) Performance Requirement - Notice of Proposed Rulemaking [Docket No. NHTSA 99-6550]

The Truck Manufacturers Association (TMA), whose members include all of the major U.S. and Canadian manufacturers of medium and heavy-duty trucks (greater than 8845 kilograms (19,500 pounds) gross vehicle weight rating) submits the following comments in response to the subject Notice of Proposed Rulemaking. TMA member companies include: **Ford Motor Company, Freightliner Corporation, General Motors Corporation, Mack Trucks, Inc., Navistar International Transportation Corp., PACCAR Inc, Volvo Trucks North America, and Western Star Trucks Inc.**

TMA member companies have carefully reviewed the subject NPRM, NHTSA Report DOT HS 808 94 1, *Single-Unit Truck and Bus ABS Braking-in-a-Curve Performance Testing* and their own test data. TMA supports the agency's development of suitable performance requirements applicable to single-unit trucks and buses and the general concept of the braking-in-a-curve test. TMA member companies assisted NHTSA in the experimental design of the agency's single-unit vehicle braking-in-a-curve track test program that developed the data that serves as the basis for this proposal, and provided the test vehicles. We do, however, have some technical concerns with the proposal.

TMA, principally because of safety concerns, requests that NHTSA reconsider its decision to require the braking-in-a-curve test in the loaded to GVWR test condition. The braking-in-a-curve test takes the vehicle to its limit of stability. The safety concern is that the vehicle will slide off the low coefficient test surface of the 500-foot radius curve onto a higher coefficient of fiction surface which could result in a tripped rollover. The agency, in the preamble, states that their "... intent was to determine the minimum number of test conditions that would provide a thorough evaluation of a vehicle's braking system." The preamble also noted that the test driver

commented that the tests involving vehicles with a load at a high center of gravity (cg) height "... caused an unsettling feeling during the testing with regard to the vehicle's roll stability." NHTSA downplayed these concerns by noting that the observers who watched the testing detected no indications that the vehicles were nearing rollover, such as lifting an inside tire. TMA believes that test driver comfort level is a better indicator of vehicle stability than observers watching for tire lift-off. The NHTSA test data also indicate that increased cg height does not have an appreciable effect on the performance of the vehicle (i.e., similar brake-through and drive-through speeds were achieved).

TMA has developed a brake test database for use by its members. These data are for the chassis (incomplete vehicle) that TMA member companies produce. A review of this database indicated that braking-in-a-curve test data were available for 3 1 single-unit trucks. Attached are two tables which provide braking-in-a-curve data for these 3 1 vehicles in the unloaded and loaded test conditions. The tables indicate the vehicle wheelbase; axle configuration; in the case of loaded runs, the center of gravity height of the load in inches above the ground; the 75% maximum drive through speed in mph; the maximum braking speed in mph; and the compliance margin in mph. It should be noted that testing of this nature is repeatable to within approximately ±1 mph. With this in mind, review of the data indicates that in 29 of the 3 1 tests, the unloaded case is the worst case or the loaded and unloaded test condition produced substantially equivalent results. In only two cases was the loaded case worse and in both these cases, the compliance margin was high. **The average compliance margin for the loaded tests is 5.8 mph while that for the unloaded tests is 4.8 mph. We conclude that testing in the loaded condition provides no additional confirmation of vehicle performance and presents a significant safety risk of vehicle rollover. Therefore, it represents a non-productive allocation of test time and labor hours to perform the test runs and the additional loading/unloading sequence with no perceived benefit to vehicle safety.**

Typically the incomplete vehicle (chassis) manufacturer has very little control over vehicle body design. Also, additional axles are often added to vehicles in the aftermarket. Therefore, the braking-in-a-curve testing of a fully loaded vehicle, after factoring in Incomplete Vehicle Document (IVD) parameters specified by the incomplete vehicle manufacturer, may shift additional responsibility for certification to FMVSS 105/121 to the final stage manufacturer.

Single-unit trucks are manufactured with a wide variety of axle configurations. The tests performed by the agency only included the most common two and three axle single-unit trucks and buses, not all combinations of rear drive axles, tag axles and pusher axles. The TMA Brake Test Database includes data on additional axle configurations, but by no means covers all the possibilities that remain to be evaluated. It is, therefore, premature to conclude that the proposal is practicable for all single-unit trucks and buses. Low-volume, special configurations may need to be exempted from this portion of the standard.

STABILITY & CONTROL TEST RESULTS

Empty Trucks (31 Samples)

Entry	Wheelbase	Axle Configuration	75% Max Drive-Thru Speed, MPH	Max Breaking Speed, MPH	Compliance Margin, MPH
1	152	4 x 2	27	34	7
2	180	6 x 4	25	32	7
3	238	6 x 4	25	30	5
4	260	6 x 4	24	28	4
5	287	12 x 4	21	27	6
6	200	6 x 4	22.5	30	7.5
7	200	4 x 2	25	31	6
8	260	4 x 2	22	29	7
9	300	10 x 4	22	27	5
10	152	4 x 2	28	28	0
11	152	4 x 2	25	25	0
12	152	4 x 2	29	31	2
13	188	6 x 4	29	31	2
14	238	6 x 4	28	29	1
15	197	6 x 4	22	28	6
16	197	6 x 4	23	27	4
17	197	6 x 4	23	25	2
18	197	6 x 4	21	27	6
19	197	6 x 4	21	28	7
20	197	6 x 4	23	27	4
21	197	6 x 4	23	28	5
22	197	6 x 4	25	31	6
23	197	6 x 4	22	29	7
24	197	6 x 4	24	31	7
25	197	6 x 4	23	30	7
26	240	8 x 4	23	30	7
27	176	4 x 2	23	27	4
28	281	8 x 4	26	30	4
29	188	6 x 4	24	30	6
30	188	6 x 4	25	30	5
31	248	8 x 4	26	28.5	2.5
		Average	24.2	29.0	4.8

STABILITY & CONTROL TEST RESULTS

Loaded Trucks (31 Samples)

Entry	Wheelbase	CG Ht. Inches At GVWR	Axle Configuration	75% Max Drive-Thru Speed. MPH	Max Breaking Speed. MPH	Compliance Margin, MPH
1	152	62.2	4 x 2	27	33	6
2	180	---	6 x 4	26	34	8
3	238	76	6 x 4	26	30	4
4	260	57	6 x 4	24	32	8
5	287	66	12 x 4	17	23	6
6	200	49.3	6 x 4	21	29	8
7	200	52	4 x 2	24	30	6
8	260	48	4 x 2	21	27	6
9	300	66	10 x 4	19	25	6
10	152	62.5	4 x 2	27	32	5
11	152	60.8	4 x 2	25	28	3
12	152	60.3	4 x 2	27	32	5
13	188	72.4	6 x 4	27	32	5
14	238	75.3	6 x 4	27	28	1
15	197	75	6 x 4	23	27	4
16	197	75	6 x 4	23	29	6
17	197	75	6 x 4	23	28	5
18	197	75	6 x 4	21	27	6
19	197	75	6 x 4	21	29	8
20	197	75	6 x 4	24	31	7
21	197	74	6 x 4	23	30	7
22	197	75	6 x 4	22.5	30	7.5
23	197	75	6 x 4	22.5	30	7.5
24	197	75	6 x 4	23	29	6
25	197	75	6 x 4	22.5	30	7.5
26	240	66	8 x 4	22	25	3
27	176	74	4 x 2	23	30	7
28	281	58	8 x 4	23	31	8
29	188	75	6 x 4	24	29	5
30	188	75	6 x 4	25	30	5
31	248	73	8 x 4	23	25.5	2.5
			Average	23.4	29.2	5.8

SAE Recommended Practice J1626, *Braking, Stability, and Control Performance Test Procedures for Air and Hydraulic Brake Equipped Trucks*, is the test protocol in use by truck manufacturers and has been used to build the industry's compliance database for trucks and buses, i.e., most trucks and buses already tested for braking-in-a-curve performance used the procedures specified in SAE J1626 and the performance requirements as proposed in this Notice. **TMA would recommend that amendments to FMVSS 105 and FMVSS 121 include, wherever possible, the test procedures of SAE J1626 as amended in 1999.**

TMA believes that the agency has significantly underestimated the cost of performing braking-in-a-curve tests on previously certified vehicles. Stand alone testing will require installation of new brake system parts, burnish, loading/unloading, charges for facilities, drivers, mechanics and test engineers as well as instrumentation support and reporting. For some manufacturers, vehicle shipping to the test site will also be necessitated. A better estimate would be in the $4,500-6,000 range per test. For example, a typical burnish alone costs in the neighborhood of $1,500 while a full FMVSS 105 or 121 certification test costs $10,000-13,000.

Now that the agency has incorporated performance requirements for all classes of vehicles, it should consider removing the existing ABS design requirements. These design specifications, e.g., number and location of modulator valves, location on the vehicle of the ABS-controlled axles, and the amount of allowable wheel lock, were originally included in the standard when the reinstatement of stopping distance and the ABS requirements were proceeding as independent rulemakings and because the performance requirements applied to truck tractors only. Today, these design restrictions are counterproductive to system safety progress and TMA recommends that they be deleted from the standard.

We request the agency give careful consideration to these recommendations. TMA staff are available to provide additional information the agency may require.

Sincerely,

William A. Leasure, Jr.
Executive Director

cc: Jeff Woods